Service Manual

SHARP

MODEL

CBT-55

SPECIFICATIONS

Transmitter section

DC Power Input.....	5W (car use) 3W (portable use)
Frequency Range ...	27MHz Citizens Band
Channels	12 channels (crystal controlled)
Type of Crystal	HC-18P, 0.005% tolerance Plug-in type crystal
Transmitter Modulation.....	100%

Receiver section

Audio Power Output...	2W (maximum)
Sensitivity	1μV/m at 10db S/N
Channels	12 channels (crystal controlled)
Type of Crystal.....	Common to transmitter, 4.225 MHz higher than transmitter in frequency

General

Power Source	DC 12V (UM-1 battery X8) or 12V car battery (⊕ or ⊖ grounded) or DC 12V external power source
Antenna	Built-in telescopic antenna for portable, 50 ohm external antenna for car or base operation
Speaker	16cm X 6cm (6-1/4" X 2-1/2") P.D.S. (8 ohm)
Microphone	Dynamic microphone (600 ohm)
Accessories	Microphone with press-talk button, shoulder belt, earphone, metal frame, mounting screws
Dimensions	250mm (W) X 160mm (H) X 80mm (D) 10" (W) X 6-1/4" (H) X 3-1/4" (D)

Transistor Complement

Q1	2SC460C	..... RF Amplifier
Q2	2SC460B	..... 1st Mixer
Q3	2SC454A	..... 2nd Mixer
Q4	2SC454B	..... 1st IF Amplifier
Q5	2SC454C	..... 2nd IF Amplifier
Q6	2SC460A	..... 1st Oscillator
Q7	2SC460B	..... 2nd Oscillator
Q8	2SC458B	..... AVC
Q9	2SC458C	..... Squelch
Q10	2SB367B	..... AF Output
Q11	2SB367B	..... AF Output
Q12	2SC458B	..... 2nd AF Amplifier
Q13	2SC458A	..... 1st AF Amplifier
Q14	2SC799	..... Transmitter Final
Q15	2SC609T	..... Transmitter Driver
Q16	2SC150T	..... Transmitter Oscillator

Sharp SHARP CORPORATION OSAKA, JAPAN

GENERAL DESCRIPTION

Receiver

The input from the antenna is applied through the RF amplifier Q 1 to the mixer Q 2. Where the input signal is mixed with the oscillator signal from Q 6 and applied to the second converter Q 3 which receives the signal from crystal-controlled second-conversion oscillator Q 7. The IF output from Q 5 is detected by the diode D 1 and applied to the audio amplifier Q 13 and squelch Q 9. The amplified audio signal is applied through the driver Q 12 and the push-pull output Q 10, 11.

Transmitter

The audio signal from the microphone is applied through the audio amplifier Q 13 and the output Q 10, 11 to the final RF amplifier Q 14.

The carrier signal originated in the oscillator Q 7 is fed to the final amplifier Q 14 where it is modulated with the audio signal and fed to the antenna for transmission.

Cabinet Removal and Crystal Installation

1. Remove the battery cover retaining screw and remove the battery cover.
2. Remove the 8 cabinet retaining screws (on top, bottom, left & right), and pull out the cabinet backward.
3. Install crystals into the desired sockets marked A ~ L (R: Receiver T: Transmitter). Be sure to match the sockets of transmitter and receiver when installing crystals. The crystal for receiver is 4.225MHz higher than the crystal for transmitter.
4. When crystals are installed, re-install the cabinet.

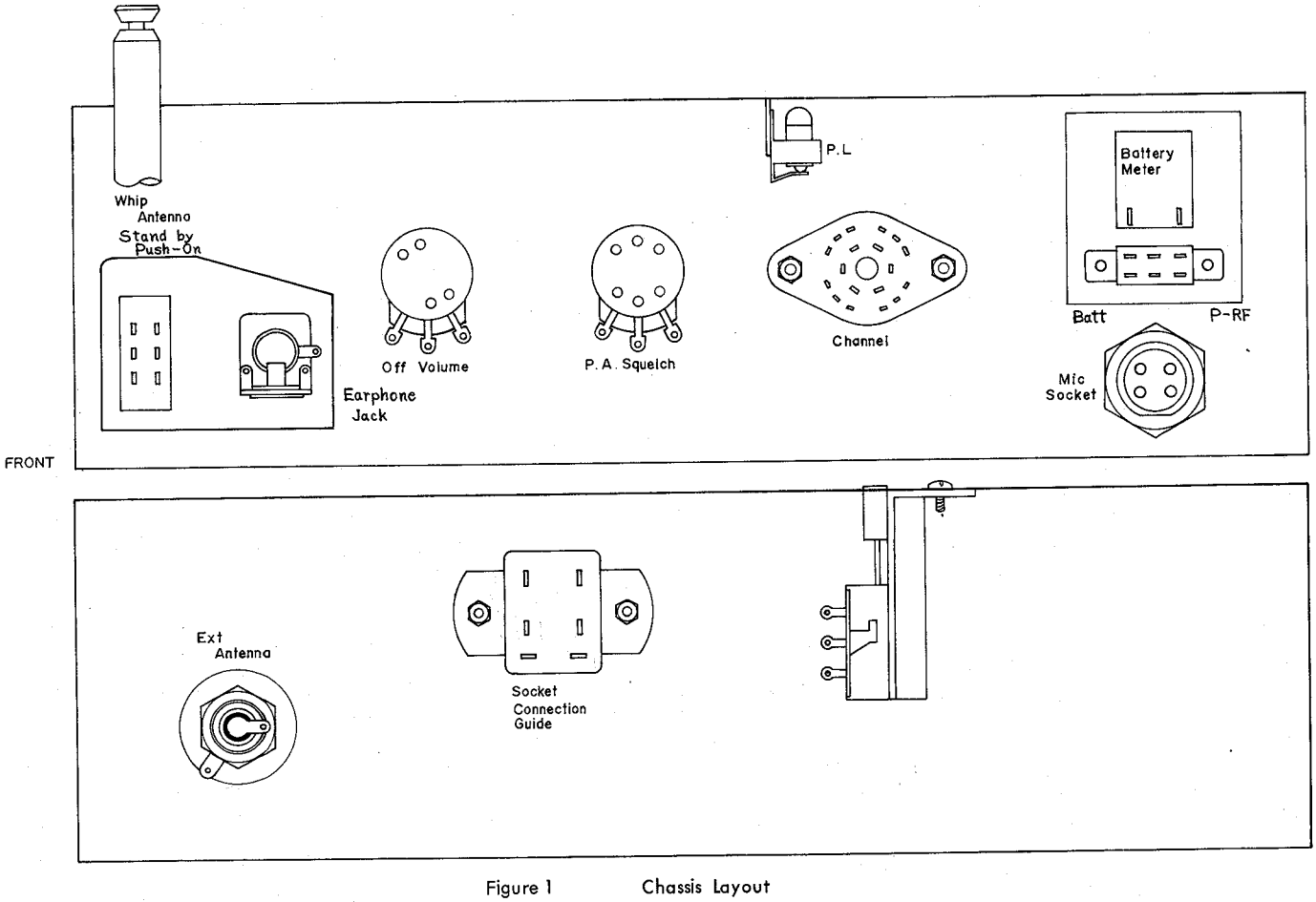

Figure 1 Chassis Layout

CRYSTAL CHANNEL/FREQUENCY CHART

CHANNEL	RECEIVER CRYSTAL FREQ, (MHz)			TRANSMITTER CRYSTAL FREQ. (MHz)		
1	CRYSTAL	– 111	31.190	CRYSTAL	– 110	26.965
2	"	– 113	31.200	"	– 112	26.975
3	"	– 115	31.210	"	– 114	26.985
4	"	– 117	31.230	"	– 116	27.005
5	"	– 119	31.240	"	– 118	27.015
6	"	– 121	31.250	"	– 120	27.025
7	"	– 123	31.260	"	– 122	27.035
8	"	– 125	31.280	"	– 124	27.055
9	"	– 127	31.290	"	– 126	27.065
10	"	– 129	31.300	"	– 128	27.075
11	"	– 131	31.310	"	– 130	27.085
12	"	– 133	31.330	"	– 132	27.105
13	"	– 135	31.340	"	– 134	27.115
14	"	– 137	31.350	"	– 136	27.125
15	"	– 139	31.360	"	– 138	27.135
16	"	– 141	31.380	"	– 140	27.155
17	"	– 143	31.390	"	– 142	27.165
18	"	– 145	31.400	"	– 144	27.175
19	"	– 147	31.410	"	– 146	27.185
20	"	– 149	31.430	"	– 148	27.205
21	"	– 151	31.440	"	– 150	27.215
22	"	– 153	31.450	"	– 152	27.225
23	"	– 155	31.480	"	– 154	27.255

ALIGNMENT

Equipment Required

Signal Generator : 400 to 500kHz and 25 to 30MHz band 1000 Hz, AM

DC Milliammeter : 0 to 500mA DC with π-network, RF filter

Audio Outputmeter : 0 to 5000mW, with 8 ohm dummy load

RF V.T.V.M. : 0 to 100MHz, 0 to 500mV

RF Outputmeter : 0 to 5W at 27MHz, 50 ohm

DC Voltmeter : 0 to 3/15V DC

Receiver Alignment

Should it become necessary at any time to check the receiver alignment of this set, proceed as follows.

1) Install the built-in telescopic whip antenna.
2) Connect the 50 ohm signal generator to the external antenna socket.
3) The power supply should be 13.2V DC.

1. First Local Oscillator Alignment
   Adjust the first oscillator coil (L3) so that the voltage on TP1 may be about 100mV.
2. Second Local Oscillator Alignment
   Adjust the second oscillator coil (L5) so that the voltage on TP3 may be about 160 mV.
3. Second IF Alignment
   Adjust the mechanical filter (F1), and second IF transformers (L6, L7 & L8) to obtain maximum audio output.
4. RF, First and Second Mixer
   Adjust the antenna coil (L1), RF coil (L2) and first IF coil (L4) for maximum audio output.

Transmitter Alignment

Should it become necessary at any time to check the transmitter alignment of this set, proceed as follows.

1) Connect DC milliammeter thru RF filter (27MHz) to test point Ⓐ and Ⓑ after opening its jumper wires. (shown in Figure 1, 2 and schematic diagram.)
2) Using external antenna load, the power supply should be 13.2V
   Using built-in antenna load, the power supply should be 12.0V (external power or battery)
   The external power should be connected to the set through RF (27MHz) filter.
3) Install the built-in telescopic whip antenna and connect the 50 ohm RF wattmeter to external antenna socket.
4) Before adjusting the surface of core should be identical with the top of the bobbin.

1. Oscillator Alignment
   Adjust the oscillator coil (L9) so that the milliammeter connected to the test point Ⓑ swing to its maximum.
2. Driver Alignment
   Adjust the driver coil (L10) so that the milliammeter connected to the test point Ⓑ swing to its maximum.
3. Matching Alignment
   Adjust the matching coil (L11) so that the milliammeter connected to the test point Ⓐ swing to output maximum.
4. π -Filter Alignment
   Adjust the π -filter coil (L12) so that the milliammeter connected to the test point Ⓐ swing to output maximum.
5. 5 Watts Matching Coil Adjustment (FCC Standard)
   When the final current exceeds 360mA, turn the matching coil (L11) in the direction to attain larger inductance and adjust it so that the final current may be less than 360mA.

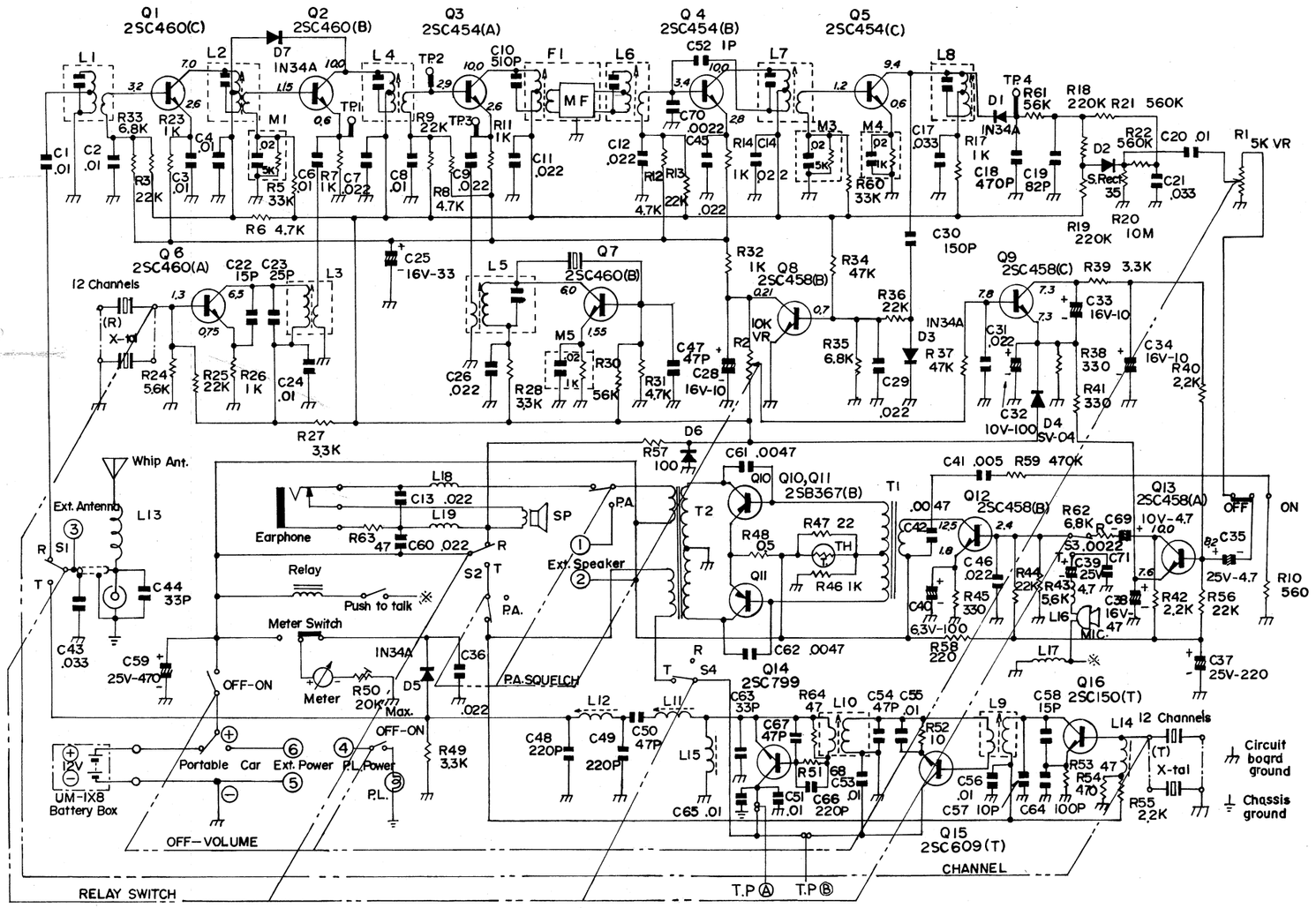

Figure 2 Schematic Diagram

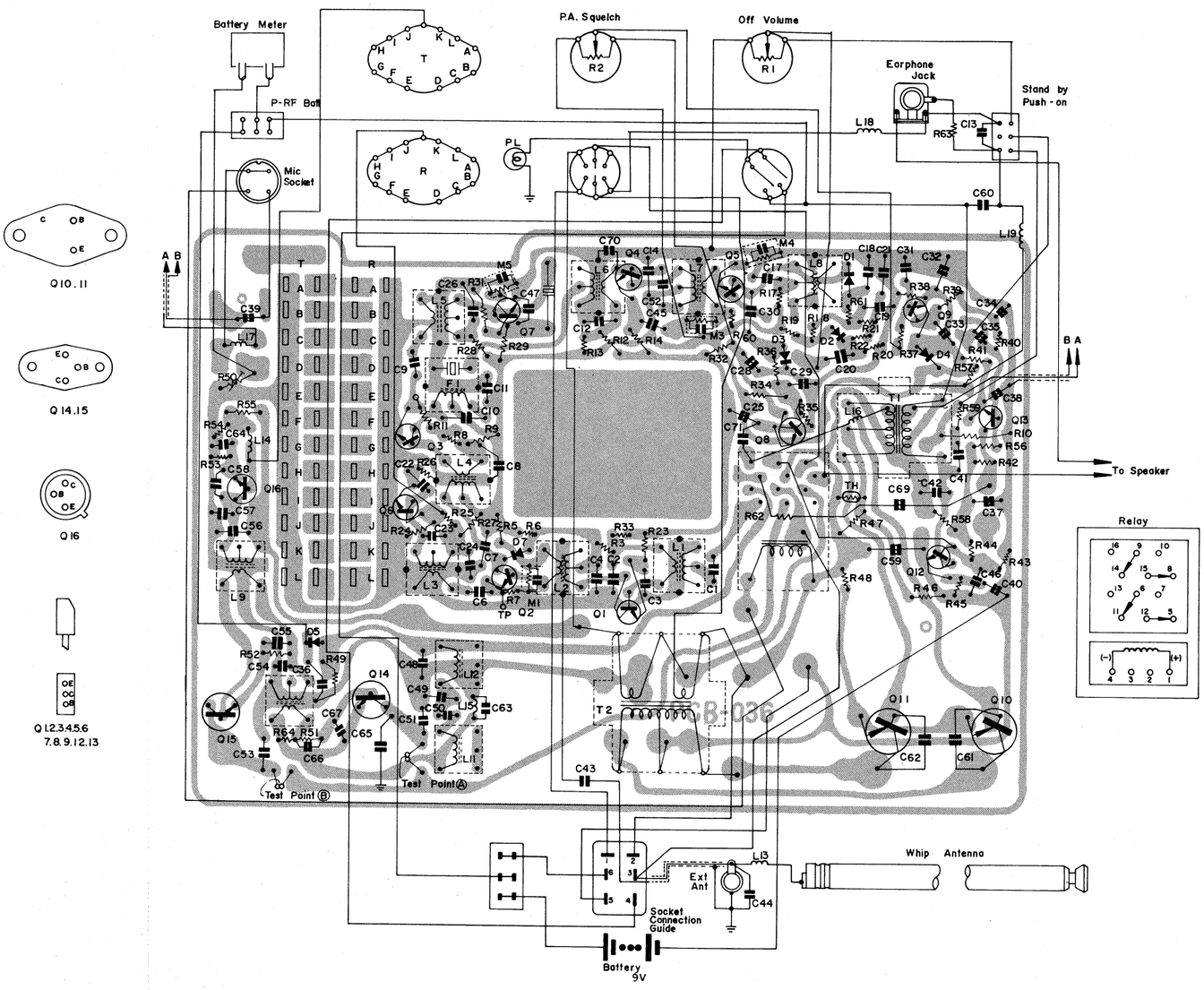

Figure 3 Wiring Side of P.C. Board

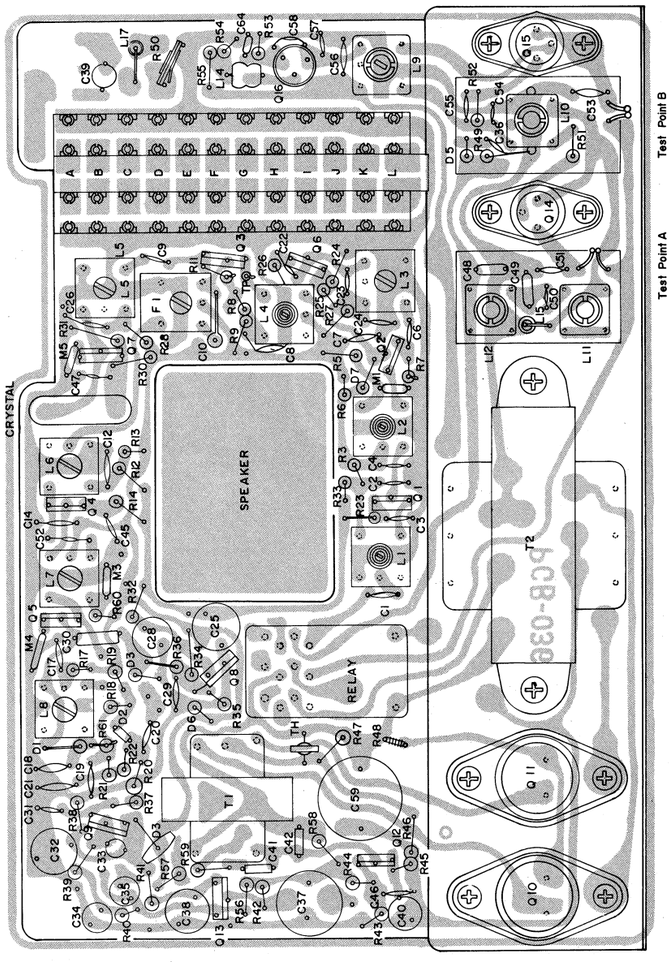

Figure 4 Component Side of P.C. Board

PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
RESISTORS		
(Unless otherwise specified resistors are ¼W, 10%, carbon type.)		
R1	1548279300	5K ohm, Pot., Off-On/Volume Control (8V-793)
R2	15482805	10K ohm Pot., P.A. Squelch (8V-805)
R3, R9, R13, R25, R36, R44, R56	1543222321	22K ohm (¼M-22KK)
R5, R60	1543233321	33K ohm (¼M-33K)
R6, R8, R12, R31, R35	1543247221	4.7K ohm (¼M-4.7KK)
R7, R11, R14, R17, R23, R26, R32, R46	1543210221	1K ohm (¼M-1KK)
R10	1543256121	560 ohm (¼M-560K)
R18, R19	1543222421	220K ohm (¼M-220KK)
R20	1543210622	10M ohm (½M-10MK)
R21, R22	1543256421	560K ohm (¼M-560KK)
R24, R43	1543256221	5.6K ohm (¼M-5.6KK)
R27, R28, R39, R49	1543233221	3.3K ohm (¼M-3.3KK)
R30, R61	1543256321	56K ohm (¼M-56KK)
R33, R35, R62	1543268221	6.8K ohm (¼M-6.8KK)
R34, R37	1543247321	47K ohm (¼M-47KK)
R38, R41, R45	1543233121	330 ohm (¼M-330K)
R40, R42, R55	1543222221	2.2K ohm (¼M-2.2KK)
R47	1543222021	22 ohm (¼M-22K)
R48	1644250922	.5 ohm, ½W, 10%, Carbon (½K-0.5K)
R50	1548277500	20K, ohm, Pot., Meter Current Adjust (8V-775)
R51	1543268021	68 ohm (¼M-68K)
R52	1543210021	10 ohm (¼M-10K)
R53, R63, R64	1543247021	47 ohm (¼M-47K)
R54	1543247121	470 ohm (¼M- 470K)
R57	1543210121	100 ohm (¼M-100K)
R58	1543222121	220 ohm (¼M-220K)
R59	1543247221	470K ohm (¼M-470KK)

(Unless otherwise specified resistors are ¼W, 10%, carbon type.)

CAPACITORS

C1, C2, C3, C4, C6, C8, C20, C24, C51, C53, C55, C56, C65	1559285300	.01 MFD, 25V, Discap	(D-2.5-105Z)
C7, C9, C11, C12, C13, C14, C26, C29, C31, C36, C45, C46, C60	1552614700	.022 MFD, 50V, Discap	(D-5-225Z)
C10	1552351727	510PF, 50V, 10%, Discap	(DS-5-517K)
C17, C21, C43	1552618300	.033 MFD, 50V, Discap	(D-5-335P)
C18	1552347717	470PF, 50 V, 5%, Discap	(DS-5-477J)
C19	1552382817	82PF, 50V, 5%, Discap	(DS-5-828J)
C22, C58	1552215817	15PF, 50V, 5%, Discap	(D-5-158J)
C23	1552225817	25PF, 50V, 5%, Discap	(D-5-258J)
C25	1661233213	33MFD, 16V, Electrolytic	(CU1.6-332Q)
C28, C33, C34	1661210213	10MFD, 16V, Electrolytic	(CU1.6-102Q)
C30	1552315717	150PF, 50V, 5%, Discap	(DS-5-157J)
C32	1661210112	100MFD, 10V, Electrolytic	(CU-1-101Q)
C35, C39	1661247325	4.7MFD, 25V, Electrolytic	(CU2.5-473R)
C37	1661222115	220MFD, 25V, Electrolytic	(CU2.5-221Q)
C38	1661247213	47MFD, 16V, Electrolytic	(CU1.6-472Q)
C40	1661210111	100MFD, 6.3V, Electrolytic	(CU-06-101Q)
C41	1556250637	.005MFD, 50V, 20%, Mylar	(ML-5-506M)
C42, C61, C62	1556247637	.0047MFD, 50V, 20%, Mylar	(ML-5-476M)
C44, C63	1552233817	33PF, 50V, 5%, Discap	(D-5-338J)
C47, C50, C54, C67	1552347817	47PF, 50V, 5%, Discap	(DS-5-478J)
C48, C49, C66	1552322717	220PF, 50V, 5%, Discap	(DS-5-227J)
C52	1552210917	1PF, 50V, .25PF, Discap	(D-5-109C)
C57	1552210837	10PF, 50V, 1PF, Discap	(D-5-108F)
C59	1661247115	470MFD, 25V, Electrolytic	(CU2.5-471Q)
C64	1552310717	100PF, 50V, 5%, Discap	(DS-5-107J)
C69	1661247322	4.7MFD, 10V, Electrolytic	(CU-1-473R)
C70	1556222637	.0022MFD, 50V, 20%, Mylar	(ML-5-226M)
C71	1552613300	.0022MFD, 50V, Discap	(D-5-226Z)

PACKAGED CIRCUITS

M1, M3	1656631500	Capristor, 5K ohm + .02MFD	(PRC-315)
M4, M5	1656633200	Capristor, 1K ohm + .02MFD	(PRC-332)

COILS AND TRANSFORMERS

L1	1508215800	Coil, Antenna	(8L-158A)
L2	1507258500	Coil, RF	(7L-585C)
L3	1507246600	Coil, 1st Local Oscillator	(7L-466B)
L4	1507258600	Coil, 1st IF	(7L-586C)
L5	1507207400	Coil, 2nd Local Oscillator	(7L-074B)
L6	1507281400	Coil, 2nd IF (1st Stage)	(7IF-814)
L7	1507282300	Coil, 2nd IF (2nd Stage)	(7IF-823)
L8	1507282400	Coil, 2nd IF (Final Stage)	(7IF-824)
L9	2507247700	Coil, Transmitter Oscillator	(7L-477B)
L10	1507254000	Coil, Transmitter Driver	(7L-540C)
L11	2507254100	Coil, Transmitter Matching	(7L-541C)
L12	1507256400	Coil, Transmitter π-Filter	(7L-564C)
L13	1507296500	Coil, Loading	(7L-965)
L14, L16	1509220900	Coil, RF Choke	(9L-209)
L15, L17, L18, L19	1507293800	Coil, RF Choke	(7L-938)
T1	1516281600	Transformer, Input	(6T-816)
T2	1517284500	Transformer, Output	(7T-845)

PARTS LIST

REF.NO.	PART NO.	DESCRIPTION

SEMICONDUCTORS

Q1	1527210831	Transistor, RF Amplifier (2SC460 Ⓒ)
Q2	1527210821	Transistor, 1st Mixer (2SC460 Ⓑ)
Q3	1522220911	Transistor, 2nd Mixer (2SC454 Ⓐ)
Q4	1522220921	Transistor, 1st IF Amplifier (2SC454 Ⓑ)
Q5	1522220931	Transistor, 2nd IF Amplifier (2SC454 Ⓒ)
Q6	1527210811	Transistor, 1st Oscillator (2SC460 Ⓐ)
Q7	1527210821	Transistor, 2nd Oscillator (2SC460 Ⓑ)
Q8	1522223720	Transistor, AVC (2SC458 Ⓑ)
Q9	1522223730	Transistor, Squelch (2SC458 Ⓒ)
Q10, Q11	1522218321	Transistor, AF Output (2SB367 Ⓑ)
Q12	1522223720	Transistor, 2nd AF Amplifier (2SC458 Ⓑ)
Q13	1522223710	Transistor, 1st AF Amplifier (2SC458 Ⓐ)
Q14	1527212501	Transistor, Transmitter Final (2SC799)
Q15	1527211071	Transistor, Transmitter Driver (2SC609 Ⓣ)
Q16	1527211201	Transistor, Transmitter Oscillator (2SC150 Ⓣ)
D1	1522270101	Diode, Detector (1N34A)
D2	1522276100	Diode, A.N.L. (SI-RECT-35)
D3	1522270101	Diode, AVC (1N34A)
D4	1527270301	Diode, Voltage Regulator (SV-04)
D5	1522270101	Diode, Meter (1N34A)
D6	1527270401	Diode, Voltage Regulator (1S335)
D7	1522270101	Diode, AVC (1N34A)
TH	1522280108	Thermistor, AOC (D-1A)

MISCELLANEOUS

	11032713	Cabinet (3CAB-036)
	11332311	Decoration Metal, Front Panel (XDEC-M-036)
	11242809	Indication Plate, Front (IND-P-036A)
	11342436	Emblem, SHARP (IND-B-245)
	1193280658	Bracket, Belt (BELT-ANGLE)
	11242812	Indication Plate, Specification (IND-P-036B)
	11932452	Decoration Cover, Side (DEC-COVER)
	11242813	Indication Plate, Channel (IND-P-036C)
	11072323	Knob, Off-On/Volume, P.A. & Squelch (7K-323)
	11072322	Knob, Channel (7K-322)
	1193245300	Antenna Cover (ANT-COVER)
	1334210100	Isolating Spacer, Chassis Bottom (ZETUEN-SPAC)
	1393237300	Antenna Spacer, Chassis Top (ANT-SPACER)
	1343200153	Battery Cover (B-BUTA-036)
	1393275500	Isolating Plate, Battery Terminal (B-TZETUENP)
	1393206456	Battery Terminal (B-TANS1)
	1393255506	Spring, Battery (SPR-4036)
	1393238600	Holder, Battery (B-PIPE)
	1593270200	Meter (METER-702)
	15312434	Switch, RF-Battery (4S-34)
	1533210100	Switch, Channel (31S-1)
	1530212100	Jack, Earphone (J-121)
	15332604	Switch, Stand-By (36S-4)

REF.NO.	PART NO.	DESCRIPTION
	1571217500	Rod Antenna (ROD-ANT-175)
	2332291500	Isolation Spacer, Jack (J-SPACER)
	1570246800	Speaker (1606P-25A)
	1593290200	Microphone with Plug (MIC-902)
	1590251200	Pilot Lamp (PL-512)
	1320221800	Socket, Pilot Lamp (SO-218)
	1323221700	Connector, Ext. Antenna (CONCENT) Socket
	1320297700	Socket, Mic. Connector (SO-977)
	1150242000	Leg, Rubber (GUMLEG-420)
	1303227000	Printed Circuit Board (PCB-036)
	1533260500	Switch, Car-Portable Auto (36S-5)
	1181270200	Handle, Metal (HANDLE-036)
	11062801	Panel, Speaker (PANEL-023A)
	1393275700	Spacer, Retaining Hole (SPAC-036)
	1320297900	Socket, Car-Portable Change (SO-979)
	1593290300	Relay (RELAY-903)
	1593290400	Mechanical Filter (ME-904)
	1526220900	Crystal, 2nd Oscillator, (CRYSTAL-109) 4680kHz
		Crystal, Receiver
		Crystal, Transmitter
	1590241900	Earphone (MR-19)
	11932808	Belt with Bracket for Shoulder and Earphone Case (BELT-036)
	1330280200	Radiator (RADIATOR)
	1330280100	Plate, Radiating (HON-P-036)
	1343234653	Switch, Bracket, Car-Portable (SW-ANG-036)
	1320200500	Socket, Crystal (SO-005)